

# AGRICULTURAL NEWS LETTER

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This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.





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"MARLATE" METHOXYCHLOR INSECTICIDE HIGHLY EFFECTIVE, SAFE TO USE

A new and effective insecticide that combines high insecticidal efficiency, low toxicity to warm-blooded animals, and safety to plants, is now being offered by Du Pont.

The new product, known as "Marlate" methoxychlor insecticide, kills a wide variety of insects that come into contact with it or that eat it. The residual or lasting qualities of the new insecticide also are good.

Toxicological tests show that bis (methoxyphenyl) trichloroethane, the active ingredient in "Marlate", is one of the safest to warm-blooded animals of all the new insecticides. It has been established that methoxychlor has no more acute toxicity than rotenone. "Marlate" can be used freely on livestock and on crops where certain residues would be undesirable. Against nuisance insects, such as flies and mosquitoes, that attack man and animals, "Marlate" has an advantage over DDT because of its fast knock-down or paralytic action.

Experiments Indicate Uses Are Many and Varied

Careful field tests show "Marlate" to be safe on vegetables like cucurbits and beans, which are sensitive to certain other insecticides. Other crops on which it should also find wide use include cabbage, peas, soybeans, peaches, early apples, and grapes.

Specific insects against which "Marlate" can be used include Japanese beetle, rose chafer, asparagus beetle, bean leafhopper, cockroach, codling moth, Colorado potato beetle, corn earworm, cucumber beetles, flea beetles, housefly, hornflies, imported cabbage worm, melon worms, Mexican bean beetle, Oriental fruit moth, velvet bean caterpillar, and cranberry fruit worm.

Used As Dust or Spray

"Marlate" may be used either as a dust or spray, and is compatible with most commonly used fungicides and insecticides. It can readily be mixed with such fungicides as wettable and dusting sulfur, low-lime Bordeaux mixture, and such fixed copper compounds as Copper A, and with Du Pont's "Fermate," "Zerlate," and "Parzate" fungicides.

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NEW 2,4-D AMINE SALT WEED KILLER FOR USE IN EITHER CONCENTRATED OR DILUTE SPRAYS ADDED TO DU PONT LINE OF 2,4-D WEED KILLERS

Du Pont now has a 2,4-D weed killer formulation to meet the important needs. One is a dry concentrated sodium salt, one is a liquid amine salt, and another is a liquid ester. Each has special values for specific uses. In general, the two salts are used to control weeds in growing crops, while the ester form is used to control weeds in non-crop areas.

For instance, the salts are considered safest for use on small grains. On the other hand, the ester form is preferred for use under special weather conditions, and for control of water weeds in ponds, lakes drainage ditches, and canals, where the water is not to be used on susceptible crops. It also gives satisfactory control of numerous woody and other hard-to-kill weeds where crops are not involved.

Du Pont is producing a new form of weed killer, known chemically as an amine salt of 2,4-D, Dr. J. A. Evans, Du Pont entomologist, disclosed at Lansing, Mich., recently.

Dr. Evans, manager of the Agricultural Technical Service Division of the Grasselli Chemicals Department, said the chief claim of this new chemical formulation to widespread use lies in its ability to be used, primarily on growing crops, as a liquid in either dilute or highly concentrated sprays. The older Du Pont sodium salt formulation is also used primarily on growing crops, and is especially adapted for use in medium to high gallonage applications.

Continued on next page

Speaking before the annual conference sponsored by the Michigan State College and Michigan Insecticide and Fungicide Institute, Dr. Evans used the new product to illustrate the emphasis Du Pont's research and development groups are giving to scientific improvements in weed control and weed-control chemicals.

#### Growers Can Choose 2,4-D Weed Killer Best Suited to Needs

Dr. Evans, in explaining that Du Pont is now in a position to offer the sodium salt, the amine salt, and also a liquid ester 2,4-D formulation, said:

"Each permits specific weed control at utmost economies. The development of 2,4-D weed killers already shows promise of being written into agricultural chemical literature as among the most conspicuous contributions since hybrid corn and DDT."

A new booklet, now being issued by the Grasselli Chemicals Department, explains that 2,4-D, a handy abbreviation for 2,4-dichlorophenoxyacetic acid, is a plant-growth regulating material that causes weeds to die by exhausting their normal food reserves, adding:

"This material is taken up by many plant leaves and carried (translocated) to underground parts to give complete kill. 2,4-D is a selective weed killer. When used as directed it kills some types of weeds without noticeable effect on the crops in which they grow. This is its major value as a weed killer."

The booklet adds that all three forms of Du Pont 2,4-D Weed Killers are non-poisonous, non-flammable, non-corrosive, and safe to use.

"Animals grazing over areas sprayed with 2,4-D have not been affected in any way; and 2,4-D does not have a sterilizing effect on the soil when applied as recommended."

The three Du Pont 2,4-D weed killers, listed below by the names under which they are sold, are described as follows:

Du Pont 2,4-D Weed Killer -- This is a white crystalline powder containing 83.5% sodium salt of 2,4-D -- equivalent to 75.9% 2,4-D acid (1 lb. of Du Pont 2,4-D Weed Killer yields 3/4 lb. 2,4-D acid). The active ingredient is a true chemical compound--not a physical mixture. It is soluble in water, even water of the hard types. Since it dissolves readily and completely, it leaves no materials in the tank to clog spray nozzles. It gives a uniform spray that assures exactly the same amount of 2,4-D in every gallon of solution.

Du Pont 2,4-D Weed Killer is especially adapted for use on weeds in medium to high gallonage applications (10 gallons or more per acre). To make highly concentrated aqueous solutions, the amine salt is preferred.

Continued on next page

Du Pont 2,4-D 67% Amine Weed Killer -- This newer form of Du Pont 2,4-D, announced by Dr. Evans at the Michigan meeting, is a concentrated liquid salt. It contains 67% mixed ethanol amines of 2,4-D (equivalent to 40% 2,4-D acid) -- 1 gallon of Du Pont 67% 2,4-D Amine Weed Killer contains 4 1/8 pounds 2,4-D acid. It is extremely soluble in water, and can be mixed with any desired amount of water by pouring the two liquids together. The concentration of Du Pont 2,4-D 67% Amine Weed Killer is just right for easy mixing of 2,4-D spray - a pint gives approximately 1/2 lb. of 2,4-D acid. Being a liquid, it can be measured easily and quickly for spray preparations -- there is no chance for nozzle clogging.

Du Pont 2,4-D 67% Amine Weed Killer is especially prepared for use in low gallonage applications, (10 gallons or less per acre). It can, however, be used for more dilute sprays with equal effectiveness.

Du Pont 2,4-D 46% Ester Weed Killer -- This is an oily, liquid form of 2,4-D containing 46% isopropyl ester of 2,4-D, equivalent to 38.6% 2,4-D acid or 3 1/3 lbs. per gallon. It can be mixed with either oil or water for application to weeds.

Generally the ester form of 2,4-D is more injurious to small grains and similar crops when used for the selective control of weeds in the growing crop. For this purpose the salt forms are preferred. The ester form, however, is more effective for weed control under conditions involving harder-to-kill herbaceous and woody plants, in dry weather and under conditions where the salts are subject to washing off, and similar circumstances. When 2,4-D is used in oil for weed control, Du Pont 2,4-D 46% Ester Weed Killer should be used at the recommended concentration.

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NOTE: The new Du Pont booklet entitled "For Better Weed Control Depend On Du Pont 2,4-D Weed Killers," discusses the importance of weed control, the different formulations, methods and time of application, control of weeds in various crops and other valuable information. Copy will be sent upon request to the Agricultural Chemicals Division, Grasselli Chemicals Department, Du Pont Company, Wilmington 98, Del.

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MIXTURE OF TOXICANTS CONTROLS MOST COTTON INSECTS

To control the major insects that attack the cotton crop, "definite advantages" result from mixing three different, compatible, chemical toxicants, each of which kills some of the insects that are not controlled by the other two, according to the report of the Stoneville, Mississippi, Conference of state and federal entomologists engaged in cotton insect investigations.

This report was presented to more than 400 representatives of agriculture, industry, and government attending the National Cotton Council's Southeastern Cotton Insect Control Conference at Columbia, S. C., recently, by R. W. Harned, U. S. Bureau of Entomology and Plant Quarantine.

In announcing the 1948 recommendations for cotton insecticides, the report states that a mixture containing 3% gamma benzene hexachloride, 5% DDT, and 40% sulfur\*, has been "especially effective."

The Stoneville Conference recommendations, which cover the Cotton Belt from Texas and Oklahoma to the Atlantic Coast, are based on findings of 52 key federal and state entomologists and associated technical workers. They include suggestions for proper use of single chemicals, such as benzene hexachloride\*\*, DDT\*\*\*, and calcium arsenate\*\*\*\*, which has long been the standard cotton insecticide, especially for control of the boll weevil.

Benzene Hexachloride -- The results obtained throughout the Cotton Belt with benzene hexachloride show that a dosage of approximately one-third pound of the gamma isomer per acre gives satisfactory control of boll weevil, cotton aphid, cotton fleahopper, tarnished plant bug, rapid plant bug, cotton leafworm, thrips, southern green stink bug, garden webworm, and fall army worm. About one-half pound of the gamma isomer gives a quick "knock out" of a heavy aphid population.

DDT -- This insecticide is particularly useful in controlling the bollworm, pink bollworm, cotton fleahopper, tarnished plant bug, rapid plant bug, and thrips. In general, 5% DDT dusts at 10 to 15 pounds per acre have been found sufficient for control of all susceptible insects in the Southeastern states.

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\*Du Pont's Cotton Dust No. 10 meets these requirements.

\*\*Benzene hexachloride is the active ingredient in Du Pont's "Lexone"-50 insecticide.

\*\*\*Du Pont has DDT available for agricultural purposes in a variety of concentrations and formulations called "Deenate" DDT insecticides.

\*\*\*\*Du Pont Calcium Arsenate, used either as a dust or a spray with proper diluents, is recommended by Du Pont entomologists for control of the boll worm and the cotton leafworm, as well as the boll weevil.

Continued on next page

For Western conditions, 5 to 10 per cent dusts are desirable. It was pointed out that bollworm and pink bollworm infestations require the higher rates of application, the lower concentrations and dosages being effective for most of the other insects. DDT is being used by the U. S. Department of Agriculture in its effort to check the spread of the pink bollworm, which is so serious a threat that it is under federal quarantine.

Calcium Arsenate -- This insecticide continues to be recommended as the standard of comparison for insecticides against cotton insects for which it is effective. Calcium arsenate was termed "an economical and effective insecticide" for boll weevil and cotton leafworm, but will not control the pink bollworm, cotton fleahopper, cotton aphid, common red spider, tarnished plant bug, and rapid plant bug.

For control of the boll weevil and the cotton leafworm, 7 to 10 pounds of calcium arsenate per acre are recommended. For bollworm control, the amount should be stepped up to 12 to 16 pounds per acre. For cotton fleahopper, tarnished plant bug, and rapid plant bug, 15 pounds per acre of a mixture of two-thirds sulfur and one-third calcium arsenate are used.

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#### DU PONT ANNOUNCES NEW VETERINARY CHEMICALS DIVISION

The Grasselli Chemicals Department of the Du Pont Company announces the creation of a Veterinary Chemicals Division to handle the manufacture and sale of veterinary chemicals.

Walter H. Salzenberg, who has been assistant technical director of the department since 1945, has been appointed manager of the new division.

Max T. Goebel, manager of the department's general research section, with headquarters in Cleveland, becomes the new assistant technical director in Wilmington.

A native of Union City, N. J., Mr. Salzenberg was graduated in chemical engineering from Lehigh University in 1929. He joined the Engineering Department of the Du Pont Company that year. After being stationed at plants of the Organic Chemicals and Grasselli departments, he was assigned to engineering development work in various fields, including acetate rayon and nylon. In 1943 he was transferred to the Grasselli department.

Dr. Goebel was born at Compton, Ill. He received his A. B. degree from the University of Illinois in 1928 and his Ph. D. in chemistry in 1934. He began his career with the Du Pont Company as a research chemist at the Experimental Station in Wilmington in 1934. In 1941 he was transferred to Cleveland as assistant manager of the general research section of the Grasselli Chemicals Department, and in 1944 was promoted to manager.

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SYNTHETIC DETERGENTS UNUSALLY SOLUBLE

Synthetic detergents, sometimes called "soapless soap," are marketed in powder and crystal form under a variety of trademarks. They are excellent cleansers, and are economical because there is no waste.

The term detergent may be applied to all cleaners; soap is only one form. The synthetic detergents are made from such raw materials as petroleum, cocoanut oil, and other animal and vegetable oils, by complicated chemical processes. The unusual solubility of these new detergents in water, especially hard water, at low temperatures is extremely advantageous. It is estimated that the ratio of soap to synthetic detergents needed in hard water is up to ten to one.

Du Pont supplies basic materials to manufacturers of detergents for use in making proprietary products. The company's Organic Chemicals Department makes MP 189 (saturated hydrocarbon sodium sulfonates) in the form of white flakes for textiles and other industrial uses. MP 189 goes into many of the new "soapless soaps," which are far superior to orthodox soap for numerous purposes, including the cleaning of dairy utensils and milking machines.

Continued on next page



SYNTHETIC DETERGENTS CLEAN DAIRY EQUIPMENT FASTER, EASIER  
CLEANER, AND MORE ECONOMICALLY -- GREATLY REDUCE BACTERIA COUNT

The same new synthetic detergents the housewife uses to form free-rinsing suds to wash her dishes, glassware, windows, kitchen utensils, stockings, and lingerie, are now being used by farmers to clean dairy equipment faster, easier, cleaner, and more economically.

These new detergents remove milk fat, milk slime, scum, and milkstone in less than a third the time required by older methods. They not only dissolve the milkstone, but leave a chemically clean surface, thus also helping to prevent formation of new milkstone. They do away with hard brushing and scouring because they pierce grease and dissolve the scumlike coating of milk, floating it away. Farmers have quickly adopted the synthetic detergents as cleansers because they learned the synthetics were superior to soap in hard water -- and many farms are in areas where the water is very hard.

Dairy technologists say use of such synthetic detergents not only saves time and labor, but assures better quality cream and butterfat. While the new synthetics now being sold under various trade names are not offered as bactericides, they do greatly reduce the bacteria count because they clean the milking machines and other dairy equipment cleaner. It is for this reason that the synthetic detergents assure cream and butterfat of high quality.

Prof. W. L. Slatter, Department of Dairy Technology, Ohio State University, in an article on "Washing Dairy Utensils," in "Hoard's Dairyman," for September 10, 1947, emphasizes the fact that "washing dairy utensils is one of the most important jobs on a dairy farm."

"One of the most important factors in the production of high quality is keeping bacteria out of the milk," he adds. "Dairy utensils are by far the greatest single source of bacteria in milk, especially improperly washed and cared-for utensils. Some investigators have found that as many as 80 to 90 per cent of the bacteria found in milk are direct descendents of bacteria introduced into the milk by the dairy utensils. This means that time spent washing and caring for milk utensils properly is time well spent and good insurance for the success of the dairy enterprise."

Four Steps In Proper Washing of Dairy Utensils

Professor Slatter outlines four steps for proper washing of dairy utensils, as follows:

1. Rinse utensils in clean, cold water at once after milking.
2. Scrub all equipment with a warm solution of clean water and a synthetic detergent or soapless cleaner.
3. Rinse utensils with boiling water.
4. Place utensils to drain and dry in a place protected from flies, dirt, and dust until next milking.

Continued on next page

Discussing Step No. 2, he says: "To do a good job of washing, the water must be clean and at a temperature of 110° to 120°F. so the butterfat is in a liquid condition; otherwise it is difficult to remove. Soapless cleaners are desirable because they cut the grease and rinse clean. Soap does not clean as well, and will not easily rinse off but tends to leave a residue in which millions of bacteria can grow. All equipment must be scrubbed with a brush, not a rag. A brush gathers few bacteria -- a rag may be loaded with millions."

Incidentally, a number of manufacturers are now producing special nylon-bristled brushes for use in cleaning dairy equipment.

#### Simple Procedure for Cleaning Milking Machines

Professor Slatter says much poor milk can be traced to milking machines that have been improperly cared for and cleaned. He outlines "a simple procedure, which, if followed carefully, will readily do a good cleanup job," as follows:

"1. Immediately after milking and while the milker is still attached to the vacuum line, suck a pailful of lukewarm water through the teat cups and tubes. Use an air brush, that is, lift the teat cups out of the water repeatedly to alternate the flow of water and air. Shake the milker pail to rinse all of the interior surface, then empty the pail and reassemble.

"2. Dissolve two tablespoonfuls of a suitable wetting agent in a pailful of warm water (110-120°F.) and allow the suction to draw this solution through the teat cups and tubes. Use air-brush procedure as in Step No. 1. While the solution is being sucked into the pail, wash the outside of the teat cup assembly and tubing with a bottle brush. Shake the unit so that all inside surfaces will be thoroughly wet. Remove the suction head and sealing rubber while the solution is still in the pail. Brush the rubber, the suction head, and the pail both inside and out. Then empty the pail. Synthetic detergents are soapless cleaners which may be obtained from grocery stores or most milk plants or creameries.

"3. Reassemble the unit and suck a pailful of boiling water through the teat cups and tubes, but do not use the air brush. Shake the pail so that all surfaces will be thoroughly rinsed. Disassemble and empty the pail.

"4. Put the metal parts to drain and dry on a utensil rack and place the rubber parts to soak in a lye solution. The rubber parts can be put to soak in a lye solution in a stone crock, or the milk tubes and teat cups can be placed in a lye solution rack and filled with the lye solution."

The Ohio technologist adds that just before milking, all utensils should be sterilized with a bacteria-killing solution. He recommends boiling water or a chlorine solution, saying the latter is usually more convenient than boiling. He urges that all equipment so treated be drained and used immediately.

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WHY IS WHEAT A GOOD EXPORT FOOD?

This question, frequently asked these days, is answered by the U. S. Department of Agriculture in its new handbook on "Grain Conservation on Farms." The booklet says: "Wheat is easily shipped and stored. It requires very little special handling as is the case with many other foods.

"It has a high caloric value in relation to its cost. For example, bulk wheat landed at Bremen, Germany, costs less per 1,000 calories than any other major food, particularly those that require a great deal of processing and packaging. This calorie-cost relationship is important to nations that must buy carefully.

"Wheat is a food that Europeans have used for centuries. They know how to mill it, to package it, to prepare it in their kitchens. Thus, they prefer wheat to corn."

Emphasis Also on Foodstuffs Other Than Grain

The booklet points out, however, that the Cabinet Committee on World Food Programs reported to the President, Sept. 22, "It is obvious that the United States will have to put more emphasis on shipments of foodstuffs other than grain." These might include dry beans and peas, fats and oils, dairy products, dried fruits, citrus juices, vegetables, poultry products, and fish, the handbook says.

POISONING RATS, CONTROL OF INSECTS AND ANIMAL PARASITES AMONG  
RECOMMENDATIONS IN NEW U. S. D. A. HANDBOOK ON GRAIN CONSERVATION

Populations of the common house rat, "by far the most destructive animal in the world," can be quickly reduced by improved modern methods, which include the use of such rodenticides as Antu.

So says a new handbook, "Grain Conservation on Farms," issued by the Office of the Secretary of Agriculture in Washington.

Pointing out that grain must be conserved to help hungry people abroad and to stretch our own feed supplies, the handbook includes recommendations for feeding hogs, beef cattle, dairy cattle, poultry, sheep, horses and mules.

Continued on next page



It discusses pasture management, storage of wheat and corn, and fire protection. It urges the farmer to ask his country agricultural agent about measures for control of insects on growing feed crops, and gives information on control of insects in storage and of parasites of livestock and poultry. It also contains much valuable information on other phases of conservation.

#### Control of Rats Year-Round Proposition

Discussing control of rats, the handbook calls upon farmers to remove everything that might shelter rats, to poison rats regularly and on a community basis if possible, to fumigate rat burrows, trap rats wherever poison cannot be used, and to cut off the food supply of rats because "a hungry rat is easily trapped or poisoned."

"Make your control program a permanent, year-round proposition, involving all the plans listed above," the handbook says. "Do not expect a few days of poisoning rats to solve your problem."

The booklet says that in the United States alone rats annually destroy about 4 per cent of the total grain and cereal crop.

"The rat is also a serious menace to humans, being a carrier of the bubonic plague, typhus, and many other deadly diseases," it adds. "Nearly all farms are thus exposed to disease and suffer damages, for few are entirely free of rats."

#### Antu Rodenticide In Bait Mixtures Recommended

The Fish and Wildlife Service, U. S. Department of Interior, which prepared the section of the handbook dealing with rat control, says Antu is "a good poison" for the common brown or Norway rat. The Service recommends use of 1 to 2 per cent of Antu in bait mixtures.

"In stubborn cases, prebait for two to three nights, with unpoisoned bait," it continues. "Pick up uneaten bait each morning. Use same bait, poisoned, when rats come regularly to baited places." Bait boxes should be used where it is desirable to eliminate possible hazards to pets.

The discussion emphasizes that success in poisoning depends upon use of fresh bait. Baits attractive to rats include bread crumbs, back fat, hamburger, and fish.

The handbook says county agricultural agents can often arrange control projects in cooperation with district agents of the Fish and Wildlife Service.

#####

"SAFETY COLOR CODE" CAN HELP FURNISH SAFER PLAYGROUNDS

.....  
: Recently published statistics emphasize the necessity of keep-  
: ing children from playing in the streets.  
:

: The National Safety Council reports the total accidental death  
: rate for children from five to 14 years old decreased 10 per cent  
: between 1945 and 1946. At the same time, however, the ratio of  
: school-age children killed in motor accidents rose from 10.8 to  
: 11.7 per 100,000.  
:

: The total number of children injured while playing in the  
: streets is not as big as for some other classifications -- such as  
: dashing from one side to the other outside of intersections. Never-  
: theless, the need to reduce still further the figures of youngsters  
: killed or maimed while playing in public thoroughfares, including  
: farm children struck down on rural or village highways, is readily  
: admitted.  
:

: While playgrounds in general are already comparatively safe  
: places, safety experts feel that some simple measures can be taken  
: to improve the situation, both in urban and rural areas. One  
: method is the adoption of the "Safety Color Code," introduced by  
: Du Pont at the 1944 annual convention of the Greater New York  
: Safety Council, and widely accepted in industry throughout the  
: United States.  
:  
: .....

Recommendations of industry's "Safety Color Code" are simple, and can be easily adapted for use on such playground equipment as slides, see-saws, swings, swing rings, sand boxes, jungle gyms, and trash cans.

The code is based on the traditional association of colors for certain purposes by people of all groups and ages. The psychological effect of these colors has been thoroughly tested -- both in the laboratory and in practice. Only six colors are used -- high visibility yellow; alert orange; safety green; fire-protection red; precaution blue; traffic white.

Here is the way colors could be employed on equipment in playgrounds:

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SLIDES: Green is the logical color. It is a popular color. It is conductive to happiness, and counteracts the excessive brightness of sunlight. Furthermore, it is very restful to children's eyes. The steps leading to the top of the slide should be painted yellow to increase their visibility. The contrast between green and orange or yellow will automatically draw the attention of children to watch out for the steps, and be more careful going up.

SEE-SAWS or TEETER-TOTTERS: Green is a pleasing color to use here. The edges should be painted yellow. That will tend to make them more easily seen by children who are apt to be hit by them, or run into them while at play.

SWINGS and SWING RINGS: For the uprights and overhead bars, green is again the best color. The seats or rings should be painted yellow. They will thus be more easily noticed by children who might otherwise be hit by them.

SAND BOXES: Green again, as the color of nature, should be used.

JUNGLE GYMS: Blue is a good color for jungle gyms. It is cool and conservative in effect -- and is also associated with the need for precaution.

TRASH CANS: Gray, with a white star. Gray is the most practical color for waste receptacles. A white star emphasizes neatness and cleanliness. By so painting refuse cans, children are attracted and unconsciously encouraged to do their share to keep up the neat appearance of a playground.

The recommendations are not complicated or hard to follow. And playgrounds with equipment so painted can be attractive places that will do their share to keep children off the streets, out of the way of automobiles that might maim them.

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#### WHEAT SEED CLEANING AND TREATING SERVICE POPULAR IN GREAT PLAINS AREA

Use of portable machines to clean and treat seed wheat is proving popular in the Great Plains states, particularly in Kansas where the project was started last year.

Twenty portable units, each with a capacity of 125 to 150 bushels per hour, were placed in this area by C. E. Skiver, director of the Kansas Wheat Improvement Association of Manhattan. Mr. Skiver, who designed the machine, says fifteen units remained in Kansas, two went to Texas, two to Nebraska, and one to Oklahoma.

All but three of the units used in 1947 were owned by county farm bureaus. Additional units are being made available in 1948, one concern having announced plans to build a number for sale to individuals.

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Last year, the mills that support the Kansas Wheat Improvement Association subscribed enough money to buy ten trucks and twelve cleaning and treating units, and placed them with the county farm bureaus in Kansas. These county groups operate the machines, under the supervision of the county agricultural agents. They will retire the purchase price from part of the proceeds obtained from the farmers, who pay 12 to 15 cents per bushel for the service, at the farm. The New Improved "Ceresan" seed disinfectant, used to treat the seed against the smuts and other surface seed-borne diseases and certain soil-borne diseases such as seed decay, root rots, and seedling blights, was furnished as part of the service.

Mr. Skiver says his Association is encouraged in its hope that individuals will eventually take over the entire program. Several units have already been bought by individuals, and requests for more have been received.

#### Each Unit Has Automatic Treater To Apply New Improved "Ceresan"

Each of the units now in use consists of a large-type cleaner with variable air speed and traveling brushes to keep the screens open, a power unit, a dust feeder for application of New Improved "Ceresan" (or the new "Ceresan" M seed disinfectant), as well as augers and conveyors to make all operations automatic. These machines, made by the Forster Manufacturing Company at Wichita, were assembled on a special truck-bed, adapted to any standard 1½-ton truck chassis. The machines place the cleaned and "Ceresan"-treated grain either in sacks or back into the bin or into a truck. The complete unit sells for \$3,600.

#### Service Convenient, Efficient, and Inexpensive

"The service proved popular with growers because it was convenient, efficient, and cheaper than would be the case if the grower had to own and house the equipment," Mr. Skiver says. "Since the machine weighs about as much as 50 bushels of wheat, it is much more economical to move the machine to the seed than to truck the seed to a central location. Special design makes the machine easy to clean out between jobs, thereby avoiding contamination and mixture of seed stocks."

#### Salvaged Feed More Than Pays Service Cost to Farmers

"The units averaged 25,000 bushels each for the wheat-cleaning season of August and September," Mr. Skiver adds. "In addition to removing the weeds and foreign material and treating the seed, these units salvaged enough feed in the form of screenings to more than pay the service cost to the farmer. This saving made the service even more popular."

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### NYLON PAINTBRUSH BRISTLES IMPROVED BY RESEARCH AND DEVELOPMENT

Nylon paintbrush bristles, first introduced in 1938, have during the past ten years been constantly improved through research and development.

Today, under comparable conditions, nylon paintbrush bristles give equal or better performance than the finest animal bristles. This has been proved by laboratory tests and by extensive field reports. Painting concrete surfaces, as well as ordinary use such as painting the barn, the henhouse, or the family home have established nylon's qualities.

#### Last Three To Five Times Longer Than Other Types

Nylon-bristled brushes last three to five times longer than other types, which means substantial saving in money spent for brushes. They pick up, retain, and spread the paint efficiently, and can be used with all types of oil and water paints, synthetics, lacquers, and enamels. Use of paint deodorants is preferred by some customers. Commercial deodorants may be safely used. They do not affect nylon bristles. Nylon bristles come in controlled length, diameter, and ratio of taper; will not split, fray, or become brittle. And they resist most chemicals as well as attacks by rodents, insects, and fungi.

In one test, a nylon-bristled brush used for 800 hours on 80,000 square feet of surface was only one-eighth of an inch shorter than when new. Another brush bristled with nylon, after being used six days a week for eight months, continued to hold paint well and spread it evenly, while other brushes with animal bristles used on the same jobs were worn out and thrown away.

#### Du Pont Scientists Develop Suitable Means of Tapering Filaments

Nylon filaments as first introduced were of uniform diameter. Then Du Pont engineers, after long research, developed a means of tapering the filaments to make them suitable as paintbrush bristles. Since this tapering is controlled and not subject to the whims of nature, all bristles are produced in the shape and ratio of taper which exhaustive tests have shown to be the most effective for spreading paint.

#### Use of Nylon Bristles Enables Brushmakers to Do "Hand-Tailoring"

Actual construction of paintbrushes contributes largely to their paint-pickup capacity. Scientific blending of different bristle lengths, for instance, increases paint-holding capacity, as well as paint-spreading efficiency. Since nylon filaments are delivered in controlled specified sizes and do not require sorting, sterilizing, or trimming, brushmakers can devote the time and effort formerly expended on these activities to "hand-tailor" construction.

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Among various effective means developed by brushmakers to obtain utmost advantage in brushes made with nylon bristles are special mixtures and filament lengths, and special brush shapes and designs. And, since nylon bristles lend themselves to all types of processing, special waving, crimping, and grinding methods have been evolved.

#### Cleaning and Storing Nylon Brushes and Reclaiming Old Brushes

Unlike hog bristles, nylon is not affected by whitewash or calcimine. On the other hand, nylon bristles should not be used in shellac, which softens but does not permanently harm them.

To get maximum value with nylon-bristled brushes, it is best to use an older brush for the first and second coats on a rough surface and a newer brush for the final smooth covering. Pointers on care of paintbrushes include: Do not try to soften a stiff brush in paint. Paint doesn't soften paint. Use a solvent or thinner. Don't ride your paintbrush. A heavy, forcing stroke does not distribute paint properly and ruins your brush. Cleaned and stored brushes should be removed occasionally and oiled with linseed oil. This will help keep them in excellent condition. Fill holes in wood and cement with proper filler. Do not try to fill them with paint. This harms your brush and destroys the appearance of the job.

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NOTE: An illustrated booklet, "How You Can Save Money On the Job With Paintbrushes Bristled With Du Pont Nylon," will be sent on request. Address the Editor, Du Pont "Agricultural News Letter," Wilmington 98, Delaware

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USE OF NEW IMPROVED "CERESAN" GREATLY INCREASES YIELD OF FLAX

New Improved "Ceresan" seed disinfectant, which is used to get better stands and to control seedling diseases, gave in 1947 an average gain of more than six bushels of flax seed per acre and cut planting-seed costs in half.

"Disinfecting the planting seed is more important than ever now," Dr. C. S. Reddy, Iowa Agricultural Experiment Station plant pathologist, recently told a group of flax growers. His remarks, reported in Iowa State College's weekly publication, "Better Iowa," emphasized the fact that "with demand for linseed oil still outrunning production, flax continues to be a profitable crop for adapted areas."

Experiments Conducted By Iowa Experiment Station

"Experiments with flax-seed treatment conducted by the Iowa Agricultural Experiment Station in 1947 showed that New Improved 'Ceresan', applied one ounce per bushel, more than doubled the number of seed which came up," the report continues. "This means that a farmer got a better stand by sowing two pecks of treated seed per acre than from four pecks of untreated seed."

The average increased yield of 6.4 bushels was for the six varieties tested, including Minerva, a golden flax, and the brown seed varieties such as Bison, Koto, and Dakota.

"Treated Minerva seed had a 52 per cent emergence as against only 8 per cent for untreated. The yield was about the same as with brown seed varieties," Dr. Reddy said.

"Most of the brown seed varieties responded nearly alike to treatment. In the tests, 25 to 30 per cent of the untreated live seeds came up as compared to over 60 per cent from treated."

Dr. Reddy said that one ounce of New Improved "Ceresan" per bushel is the best treatment for the brown seed varieties. He added: "The formerly recommended rate of one-half ounce per bushel was only three-fourths as effective in the tests."

The Iowa scientist also pointed out that it is advisable to increase the dosage to one and one-half ounces per bushel with golden flax.

He added that flax can be treated any time until seeding time, and that seed treated ahead of time should be stored in a dry place.

"Be sure to treat the seed at least 24 hours before planting so that the fungicidal chemical has time to distribute itself over the entire surface of the seed," he concluded.

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TESTS SHOW MIXTURE CONTAINING BENZENE HEXACHLORIDE GIVES  
EXCELLENT CONTROL OF LARVAE AND NYMPHS OF SPINOSE EAR TICKS

A preparation consisting of benzene hexachloride, in either xylol or benzene, and pure pine oil readily destroys all larvae and nymphs of the spinose ear tick, *Otobius megnini* (Duges), in the ears of heavily infested cattle. In addition, it affords protection against reinfestation for at least 17 days, with serious reinfestation delayed a whole month.

The new benzene hexachloride solution flows freely in cold weather. It is easily applied without harm to the host animal by a modified type of an ordinary spring-bottom oiler, at the rate of half an ounce inserted into each ear, plus massaging to insure thorough distribution.

This information was developed by research workers in the Bureau of Animal Industry of the U. S. Department of Agriculture in 1945, 1946, and 1947, in tests in or adjacent to the Rio Grande Valley in New Mexico, involving 3,178 head of cattle.

Various combinations of the ingredients were injected into the ears of the cattle to determine the efficacy of the benzene hexachloride, which is the active ingredient in Du Pont's "Lexone" insecticide. Of the total, 117 were farm animals in 10 herds, examined frequently. The remainder were Hereford range cattle, examined occasionally.

Early tests with a variety of chemical materials indicated benzene hexachloride, sometimes called hexachlorocyclohexane, was more effective than all other materials used, including DDT, according to Dr. H. E. Kemper, Dr. I. H. Roberts, and Dr. H. O. Peterson, veterinarians of the Bureau, reporting in the October, 1947, issue of "The North American Veterinarian."

Prevention of Reinfestation Is Major Problem

The major problem in control of the spinose ear tick is the prevention of reinfestation, they say. The ticks are quickly destroyed by a variety of substances, but most of them do not have sufficient residual lethal effect.

"Hexachlorocyclohexane in either xylol or benzene, diluted with pure pine oil, is usually superior in this respect to all other materials or combinations of materials which we have tested in the field," the federal workers report. "Apparently some part, at least, of the residual effect of hexachlorocyclohexane is due to its fumigant properties."

The formulations containing benzene hexachloride in xylol or benzene and pure pine oil destroyed all larval and nymphal forms of the ticks within one hour. In the one test in which a water emulsion of benzene hexachloride and saponified pine oil was injected into the ears, all ticks were dead within 24 hours after treatment.

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Pure pine oil prevented reinfestation for seven days, but addition of benzene hexachloride in xylol or benzene to pure pine oil delayed reinfestation by at least 10 more days. In five tests, the minimum period of freedom from infestation was 17 days. However, it was not until later, usually the thirtieth day after treatment, that such cattle were once again appreciably infested.

#### Entirely Acceptable For Ranch Use

The use of mixtures of 3 to 5 per cent benzene hexachloride in xylol and pure pine oil on 3,049 cattle on five ranches showed that the formulations were entirely acceptable for ranch use. The preparations were free-flowing at below freezing temperatures. Their fluidity permitted the comparatively rapid injection of a half ounce into the ears of cattle. No irritation resulted, either to the lining of the ear or to the epidermis contacted by the surplus overflowing from the ear. Following treatment, the ears appeared clean, and adjacent hair was unmatted. The light pine oil is not sticky, and operators found the materials convenient to apply.

The preparations containing 5 per cent benzene hexachloride (15 per cent gamma isomer), as employed in large-scale ranch experiments, were calculated to cost approximately \$2.00 per gallon. This permitted the treatment of individual cattle at slightly less than 2 cents per head.

For further information, write Dr. H. E. Kemper, Zoological Division, U. S. Bureau of Animal Industry, P. O. Box 464, Albuquerque, N. M.

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